

REMARKS

Claims 1, 10 and 21 are amended. Claims 1-16 and Claims 21-24, as amended, remain in the application. No new matter is added by the amendments to the specification and the claims.

The Rejections:

In the Final Office Action dated July 12, 2007, the Examiner rejected Claims 1, 2, 8-13 and 21-24 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki et al, U.S. Patent No. 6598707 in view of Eastcott et al. U.S. Patent No. 4108280.

Regarding Claim 1, the Examiner stated that Nakagaki discloses an elevator installation having a car, referred to as cage 20, and a counterweight 30 connected by a drive means, referred to as front and back hoist cables 50, 60, and movable in a shaft 7 comprising a pair of car guides 22, 23 adapted to be mounted in the shaft 7, a pair of counterweight guides 31, 32 adapted to be mounted in the shaft, a crossbeam, referred to as connecting beam 33, attached to the counterweight guides 31, 32 and to car guide 22, and a drive motor, referred to as hoist 41, mounted on the crossbeam 33 and coupled to a pair of drive pulleys, referred to as front and back traction sheaves 44, 45, adapted for engaging the drive means 50, 60 to move the car 20 and the counterweight 30 in the elevator shaft 7 wherein the drive pulleys 44, 45 are operatively connected by a drive shaft with the drive motor and a brake, the drive pulleys 44, 45 being spaced apart and positioned adjacent opposite sides of the car guides 22, 23, shown in Figures 1, 3, and 4. The Examiner commented that Nakagaki is silent concerning the drive pulleys are arranged between the drive motor and the brake on the drive shaft wherein a spacing between the drive pulleys is less than an axial length of the drive motor. According to the Examiner, Eastcott teaches drive pulleys 10, 11 are arranged between a drive motor 14 and a brake, comprised of 32-35, on a drive shaft 12 wherein a spacing between the drive pulleys 10, 11 is less than an axial length of the drive motor 14, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the pulleys disclosed by Nakagaki between a drive motor and a brake as taught by Eastcott to facilitate arrangement of components due to space restraints. The Examiner also stated that it would have been obvious to one of ordinary skill in the art at the time of the invention to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor as taught by Eastcott to position the cables at a desired spacing, and furthermore, it

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would have been obvious to one of ordinary in the art at the time of the invention was made to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art.

Regarding Claim 2, the Examiner stated that Nakagaki discloses the drive pulleys 44, 45 are arranged on opposite sides of an imaginary line horizontal connector of the car guides 22, 23.

Regarding Claim 8, the Examiner stated that Nakagaki further discloses the counterweight guides 31, 32 and the car guide 22 are positioned at apices of a substantially horizontal triangle and the crossbeam 33 is fastened at end regions to the counterweight guides 31, 32 and at a center region to the car guide 22.

Regarding Claim 9, the Examiner stated that Nakagaki further discloses the car guides 22, 23 and counterweight guides 31, 32 are arranged to extend substantially vertically in the elevator shaft and the crossbeam 33 is arranged to extend substantially horizontally in the elevator shaft.

Regarding Claim 10, the Examiner stated that Nakagaki discloses an elevator installation having a car, referred to as cage 20, and a counterweight 30 connected by a drive means, referred to as front and back hoist cables 50, 60, and movable in an elevator shaft comprising an elevator shaft 7, an elevator car 30 movable in the elevator shaft 7 along a pair of car guides 22, 23 mounted in the elevator shaft 7, a counterweight 30 movable in the elevator shaft 7 along a pair of counterweight guides 31, 32 mounted in the elevator shaft 7, a crossbeam, referred to as connecting beam 33, attached to the counterweight guides 31, 32 and one of the car guides 22, and a gearless drive motor, referred to as hoist 41, mounted on the crossbeam 33 for engaging the drive means 50, 60 and moving the car 20 and the counterweight 30 in the elevator shaft 7, the drive motor 41 being connected by a drive shaft 42, 43 to a pair of drive pulleys 44, 45 engaging the drive means 50, 60, the drive pulleys being spaced apart adjacent one another and positioned adjacent opposite sides of one of the car guides 22. The Examiner commented that Nakagaki is silent concerning a spacing between the drive pulleys is less than an axial length of the drive motor. According to the Examiner, Eastcott teaches a spacing between the drive pulleys 10, 11 is less than an axial length of a drive motor 14, and it would have been obvious to one of ordinary skill in the art at the time of the invention to space the drive pulleys disclosed by Nakagaki et al. less than an axial length of the drive motor as taught by Eastcott to position the cables at a

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desired spacing. The Examiner stated that furthermore, it would have been obvious to one of ordinary in the art at the time of the invention was made to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art.

Regarding Claim 11, the Examiner stated that Nakagaki discloses two drive means 50, 60 connecting the car 20 and the counterweight 30, each drive means 50, 60 having two ends, referred to as anchoring ends 53, 57, 63, 67, and each of the ends 53, 57, 63, 67 being fixed to one of the car guides 23, via cage-side hitching beam 25, and the crossbeam 33.

Regarding Claim 12, the Examiner stated that Nakagaki discloses two drive means 50, 60 connecting the car 20 and the counterweight 30 and wherein the drive means 50, 60 are belts.

Regarding Claim 13, the Examiner stated that Nakagaki discloses the car 20 is suspended in the elevator shaft 7 with a 2:1 ratio and the drive motor 41 is arranged in a region above a travel path of the counterweight 30 in the elevator shaft 7, shown in Figures 1, 2, 4, and 5.

Regarding Claim 21, the Examiner stated that Nakagaki discloses an elevator installation having a car 20 and a counterweight 30 connected by a drive means 50, 60 and movable in an elevator shaft 7 comprising a pair of car guides 22, 23 adapted to be mounted in the elevator shaft 7, a pair of counterweight guides 31, 32 adapted to be mounted in the elevator shaft 7, a crossbeam 33 attached to the counterweight guides 31, 32 and one of the car guides 22, a drive motor 41 mounted on the crossbeam 33 and connected to a drive shaft 42, 43, a pair of drive pulleys 44, 45 adapted for engaging the drive means 50, 60 to move the car 20 and the counterweight 30 in the elevator shaft 7 wherein the drive pulleys 44, 45 are connected to the drive shaft 42, 43 and are positioned spaced apart adjacent to one another on opposite sides of an imaginary line connector extending between the car guides 22, 23 and adjacent opposite sides of one of the car guides 22. The Examiner commented that Nakagaki is silent concerning a spacing between the drive pulleys is less than an axial length of the drive motor. According to the Examiner, Eastcott teaches a spacing between the drive pulleys 10, 11 is less than an axial length of a drive motor 14, and it would have been obvious to one of ordinary skill in the art at the time of the invention to space the drive pulleys disclosed by Nakagaki et al. less than an axial length of the drive motor as taught by Eastcott to position the cables at a desired spacing. The Examiner

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stated that, furthermore, it would have been obvious to one of ordinary in the art at the time of the invention was made to space the drive pulleys disclosed by Nakagaki less than an axial length of the drive motor, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art.

Regarding Claim 22, the Examiner stated that Nakagaki discloses the counterweight guides 31, 32 and the car guides 22, 23 are positioned at apices of a substantially horizontal triangle and end regions of the crossbeam 33 are fastened to respective ones of the counterweight guides 31, 32.

Regarding Claim 23, the Examiner stated that Nakagaki discloses a center region of the crossbeam 33 is attached to one of the car guides 22.

Regarding Claim 24, the Examiner stated that Nakagaki discloses the drive motor 41 is in an area of the triangle substantially above the counterweight 30.

The Examiner rejected Claim 3 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott, and further in view of Cox U.S. Patent No. 3559768. The Examiner stated that Nakagaki discloses the drive means are belts, referred to as front and back hoist cable 50, 60. The Examiner commented that Nakagaki is silent concerning the drive pulleys are smaller in diameter than the drive motor and/or brake. According to the Examiner, Cox teaches drive pulleys 11, 25 are smaller in diameter than the drive motor 14 and brake 15, and it would have been obvious to one of ordinary skill in the art at the time of the invention to make the diameter of the drive pulleys disclosed by Nakagaki smaller than the drive motor and brake as taught by Cox because a smaller diameter sheave results in a reduced torque and an increased rotation speed of the drive motor, which increases the efficiency of the drive motor.

The Examiner rejected Claims 5 and 6 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott, and further in view of Yasuda et al. U.S. Patent No. 6488124.

Regarding Claim 5, the Examiner commented that Nakagaki is silent concerning the drive motor and the brake are mounted on a bracket fastened to the crossbeam. According to the Examiner, Yasuda teaches a drive motor 126 and a brake 118 are mounted on a bracket, referred to as support legs 120, fastened to the crossbeam 108, and it would have been obvious to one of ordinary skill in the art at the time of the invention to mount the drive motor and the brake

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disclosed by Nakagaki on a bracket fastened to the crossbeam as taught by Yasuda to facilitate the connection between the drive motor and the brake, and the crossbeam.

Regarding Claim 6, the Examiner commented that Nakagaki is silent concerning a bracket mounted at a center region of the crossbeam. According to the Examiner, Yasuda teaches the bracket 120 is mounted at a center region of the crossbeam 108, and it would have been obvious to one of ordinary skill in the art at the time of the invention to mount the bracket as taught by Yasuda at a center region of the crossbeam disclosed by Nakagaki to facilitate the connection between the drive motor and the brake, and the crossbeam.

The Examiner rejected Claim 7 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott and Yasuda, and further in view of Cox. The Examiner commented that Nakagaki is silent concerning the drive pulleys arranged substantially in a region within an enclosure of the bracket. According to the Examiner, Cox teaches drive pulleys 11, 25 arranged substantially in a region within an enclosure of the brackets, not numbered but shown attached to of the elevator shaft shown in Figure 1, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the drive pulleys disclosed by Nakagaki substantially in a region within an enclosure of the bracket as taught by Cox to make the drive pulleys readily accessible with the bracket.

The Examiner rejected Claims 14-16 under 35 U.S.C. 103(a) as being unpatentable over Nakagaki in view of Eastcott, and further in view of Yasuda.

Regarding Claim 14, the Examiner stated that Nakagaki discloses a car 20 suspended in an elevator shaft 7 with a 2:1 ratio and a drive motor 41. The Examiner commented that Nakagaki is silent concerning a drive motor arranged in a region above a travel path of the car. According to the Examiner, Yasuda teaches a car 101 suspended in an elevator shaft 103 with a drive motor 126 arranged in a region above a travel path of the car 101, shown in Figures 4-6 20, 21A, 21B, and 31-33, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the drive motor disclosed by Nakagaki in a region above a travel path of a car as taught by Yasuda to overcome elevator shaft size and shape constraints.

Regarding Claim 15, the Examiner stated that Nakagaki discloses a car 20 suspended in an elevator shaft 7 with a 2:1 ratio and a drive motor 41. The Examiner commented that Nakagaki is silent concerning a drive motor arranged in a region above a travel path of the car

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and a travel path of the counterweight. According to the Examiner, Yasuda teaches a car 101 suspended in an elevator shaft 103 with a drive motor 126 arranged in a region above a travel path of the car 101 and a travel path of the counterweight 102, shown in Figures 4-6 20, 21A, 21B, and 31-33, and it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the drive motor disclosed by Nakagaki in a region above a travel path of a car and a travel path of a counterweight as taught by Yasuda to overcome elevator shaft size and shape constraints.

Regarding Claim 16, the Examiner commented that Nakagaki is silent concerning the car suspended in the elevator shaft with a 1:1 ratio and the drive motor arranged in a region above a travel path of the car. According to the Examiner, Yasuda teaches a car 101 is suspended in an elevator shaft 103 with a 1:1 ratio and the drive motor 126 is arranged in a region above a travel path of the car 101, shown in Figures 4-6 20, 21A, 21B, and 31-33, and it would have been obvious to one of ordinary skill in the art at the time of the invention to suspend the car disclosed by Nakagaki in an elevator shaft with a 1:1 ratio as taught by Yasuda and arrange the drive motor disclosed by Nakagaki in a region above a travel path of the car as taught by Yasuda to overcome elevator shaft size and shape constraints.

Applicants' Response:

Applicants amended Claims 1, 10 and 21 to clarify that the drive pulleys are drivingly connected to the drive shaft.

The Examiner admitted that Nakagaki is silent concerning the drive pulleys are arranged between the drive motor and the brake on the drive shaft wherein a spacing between the drive pulleys is less than an axial length of the drive motor. According to the Examiner, Eastcott teaches drive pulleys 10, 11 are arranged between a drive motor 14 and a brake, comprised of 32-35, on a drive shaft 12 wherein a spacing between the drive pulleys 10, 11 is less than an axial length of the drive motor 14.

The Examiner's statement that the pulleys 10, 11 are arranged between the motor 14 and the brake assembly 32-35 on the shaft 12 is not correct. As shown in Eastcott Fig. 1, the brake assembly 32-35 is spaced radially from the shaft 12 by a distance almost equal to the radius of the wheels 10, 11. A portion of the braking assembly 32 including the brake element 33 is closer

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to the motor 14 than it is to the wheel 10. Furthermore, Claim 1 recites that the "drive pulleys are operatively connected by a drive shaft with said drive motor and a brake". Obviously, the Eastcott brake assembly 32 is not operatively connected to the wheels 10, 11 by the shaft 12.

All of Applicants' independent claims recite that the drive pulleys are spaced apart and positioned adjacent opposite sides of one of the car guides wherein a spacing between the drive pulleys is less than an axial length of the drive motor.

All the figures of Nakagaki show widely spaced drive pulleys to allow an arrangement of the integrated drive motor and brake between the drive pulleys and to get a stable suspension of the car. Nakagaki emphasizes (Col. 3, Lines 30-35) that it is preferred to dispose four car sheaves 26, 27, 28, 29 at the four corners of the floor of the car 20 to get a stable suspension of the car. Thus, the entire teaching of Nakagaki is that the car sheaves, the drive means and consequently the drive-pulleys are widely spaced to the extremities of the drive and the four corners of the car. Thus, Nakagaki teaches away from the solution of the claimed invention.

Eastcott shows closely spaced wheels 10, 11 that can not be positioned adjacent opposite sides of one of the car guides because the Eastcott brake assembly 32 acts to urge the idler wheel 11 laterally on the shaft 12 into engagement with the wheel 10. Thus, there is no room between the wheels 10, 11 for a car guide. Note also that the idler wheel 11 is not connected to or driven by the shaft 12. The wheel 11 is mounted on bearings 23 so that it rotates independently of the shaft 12. Therefore, the wheel 11 is not a "drive pulley" operatively connected by a drive shaft with a drive motor as recited in Applicants' Claim 1, nor is it a "drive pulley" connected by a drive shaft to a drive motor as recited in Applicants' Claim 10, nor is it a "drive pulley" connected to a drive shaft as recited in Applicants' Claim 21. The Eastcott wheel 10 is the only "drive pulley" connected to the drive shaft 12.

There is absolutely no motivation to combine Eastcott with Nakagaki as suggested by the Examiner, and to do so would not result in the claimed invention. Nakagaki emphasizes (Col. 3, Lines 30-35) that it is preferred to dispose four car sheaves 26, 27, 28, 29 at the four corners of the floor of the car 20 to get a stable suspension of the car. Moving the traction sheaves 44 and 45 closer together would defeat the purpose of the Nakagaki suspension configuration. Eastcott teaches closely spaced wheels 10, 11 integral with the brake assembly that prevents positioning the wheels on opposite sides of a car guide and has only one "drive pulley" 10.

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Neither Cox nor Yasuda supplies the missing elements. Clearly there is no teaching or suggestion of a combination of Nakagaki, Eastcott, Cox and/or Yasuda that would lead one of ordinary skill in the art to a solution wherein:

drive pulleys are arranged between a drive motor and a brake on a shaft (Claim 1); and the drive pulleys being spaced apart and positioned adjacent opposite sides of at least one of a pair of car guides, and the spacing between the drive pulleys is smaller than an axial length of the drive motor.

In view of the amendments to the claims and the above arguments, Applicants believe that the claims of record now define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.